

# **INVITATION TO TENDER**

**ECMWF/ITT/2019/BOND21**

## **PROCUREMENT OF NETWORK SECURITY LAYER**

**at ECMWF, Tecnopolo di Bologna, Bologna, Italy**

### **Volume II: Specification of Requirements**

**20 May 2019**

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# Background

## Definitions

Definitions used in this Invitation to Tender (ITT) are listed here:

Acceptance Date	the date or dates set out in Schedule 1 being the date or dates by which the System must successfully complete the Functional Test and User Acceptance Tests in accordance with Schedule 4 of the Contract
Agreement	volume III of this ITT including all Schedules thereto
Bill of Materials (BoM)	the list of hardware, software and services that will be purchased for the Deployment Phase 1
Contract	the documents defining the Parties' rights and obligations comprising the Agreement, ECMWF's Letter of Acceptance of Tender, the ITT Documentation and the Contractor's Tender in accordance with Clause 2.1 of the Agreement
Contractor	successful Tenderer
Data Hall	a space within the data centre that is used to host IT infrastructures and the high-performance computers and related services
Data Handling System (DHS)	large-scale Data Handling System is used to store and retrieve data that is needed to perform weather modelling, research in weather modelling and mining of weather data
Data Storage	a space within the data centre that is used to host tape library infrastructure and related services
Delivery Date	the dates, as specified in the Deployment Phase 1 Delivery Date in Volume III, or on a Purchase Order, on which the Works shall be deemed to be delivered at the ECMWF Site of Reading or Bologna
Deployment Phase 1	the first phase of Works carried out by ECMWF and the the Contractor
ECMWF	European Centre for Medium-Range Weather Forecasts
Fabric Layer	the infrastructure that interconnects the network components together to provide connectivity to all IT systems in the data centre
First Response Time	the number of minutes, hours, or days between when a customer submits a support ticket and when a customer support representative provides an initial response
Functional Test	the test that will be performed on the Works outlined in Clause 3.2 of Schedule 4 of Volume III
High Performance Computer Facility (HPCF)	the super-computing facility used to produce weather forecasts and scientific research

High Performance Network (HPN)	the name used by ECMWF to describe the Fabric Layer infrastructure
Hypercare	the stabilisation period after installation is completed
Internet Edge Layer	the infrastructure that connects ECMWF to the Internet and WAN services
ITT	this Invitation To Tender
Low-Level Design / LLD	the stage where a solution's hardware and software components are designed and configuration templates created
Manufacturer	original equipment manufacturer of the supplied hardware and software components
Network Security Layer	The infrastructure required to control critical internal and external data traffic to protect ECMWF from internal and external threats
OEM	original equipment manufacturer
Pilot Infrastructure (PI)	the infrastructure that will be used for the testing of the selected solution
PI Test Start Date	the date specified in Schedule 1 of the Contract being the date by which the Functional Test must start
Preferred Bidder	the Tenderer selected by ECMWF for the award of this Contract
Reliability Test	the test that will be performed on the Works outlined in Clause 3.3 of Schedule 4 of Volume III
Requirement	a singular documented physical or functional need that a design, product or process aims to meet
Services	all the services listed in the Bill of Materials or on a Purchase Order, to be provided by the successful tenderer to ECMWF under this Contract
Tender	a response to this ITT
Tenderer	an organisation bidding for this ITT
Tests	the tests that will be performed on the Works outlined in Schedule 4 of Volume III
User Acceptance Tests	the acceptance tests of the Pilot Infrastructure to be undertaken as defined in Clause 5 of Schedule 4 of the Contract
Works	all hardware & software furnished and all Services to be performed by the successful tenderer under this Contract
You	the recipient of this ITT, a prospective "Tenderer"

The definitions included in Clause 1 of the Contract are also applicable to this Volume II of the ITT Documentation.

## Introduction

This Invitation To Tender (ITT) has been prepared by the European Centre for Medium-Range Weather Forecasts, (governed by its Convention and associated Protocol on Privileges and Immunities which came into force on 1 November 1975, and was amended on 6 June 2010) ("ECMWF") for the purposes of obtaining proposals from Tenderers for the procurement of network security equipment. ECMWF is an independent intergovernmental organisation supported by 34 States. Information on ECMWF's activities can be found at:

<https://www.ecmwf.int/en/about>

The installation will be at ECMWF's offices in Shinfield Road, Reading, UK and its new data centre at Tecnopolo di Bologna, Via Stalingrado, Bologna, Italy from late Q3 2019 onwards. Additional information on ECMWF's current Computer Environment and LAN can be found at:

<https://www.ecmwf.int/en/computing/our-facilities>

<https://www.ecmwf.int/en/computing/our-facilities/networks>

## ECMWF's new data centre

In June 2017 ECMWF Member States approved the proposal by the Italian Government and the Emilia Romagna Region to host ECMWF's new data centre in Bologna. The new data centre is currently being built on the site of the new Tecnopolo di Bologna campus that is redeveloping the unused buildings and grounds of a former tobacco factory. ECMWF's headquarters are to remain in the UK. Details about the new data centre can be found here:

<https://www.ecmwf.int/en/about/media-centre/press-kit-bologna-host-ECMWFs-new-data-centre>

ECMWF expects the Bologna data centre will be run with a small staff complement, that includes a 24 hour a day, 7 days a week, 365 days a year (24x7x365) operations team responsible for the monitoring of the infrastructure.

## The Networks and Security infrastructure

The Networks and Security infrastructure to be deployed in Bologna and Reading will provide the enabling connectivity and security services required by all IT services operated by ECMWF. The infrastructure is made up of the following three main components:

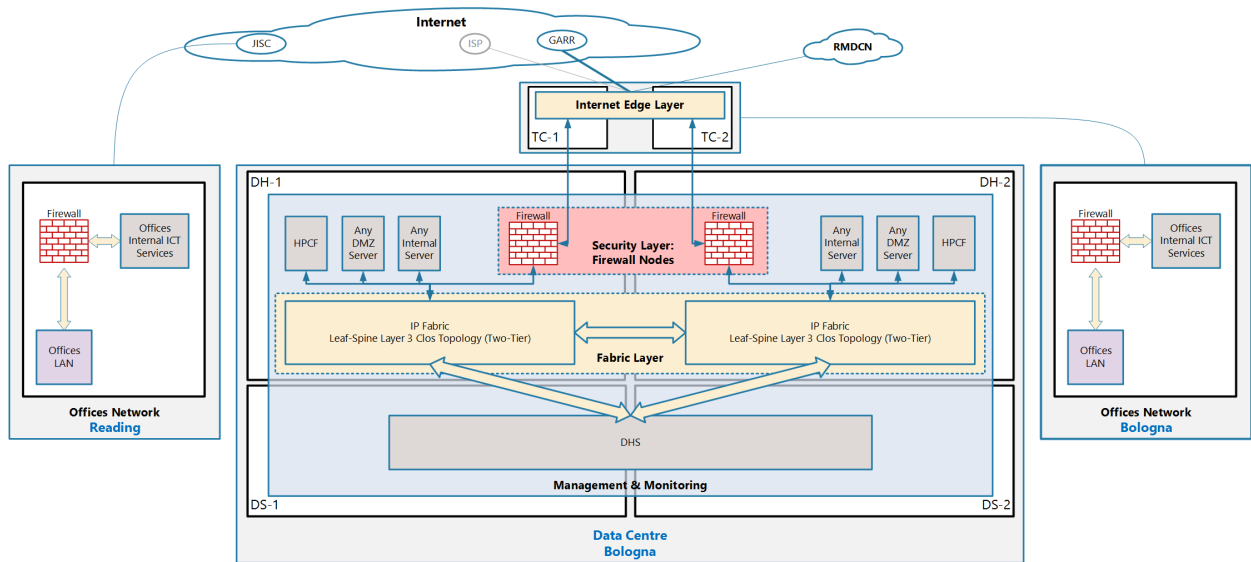
- **Fabric Layer:** the infrastructure that provides network connectivity to ECMWF's ICT platforms and services, including the High Performance Computer Facility (HPCF) and Data Handling System (DHS) systems;
- **Security Layer:** the infrastructure required to control critical internal and external data traffic to protect ECMWF from internal and external threats;
- **Internet Edge Layer:** the infrastructure required to provide connectivity between the Security Layer and the wide area network through ECMWF's Internet, RMDCN and telephony SIP connectivity;

In addition to the above mentioned three layers, physically segregated networks and infrastructures will be used to address the following specific needs:

- **Offices Networks in Reading and Bologna**

- **Management & Monitoring**
- **Auxiliary services: DNS, DHCP, and IPAM (DDI) and Network Time Protocol (NTP)**
- **Auxiliary services: Application Control and Load Sharing**

The following corporate high-level design overview gives an idea about the design components that form the Networks and Security infrastructure:



**Figure 1: Corporate network and security design overview**



## Scope of the ITT

The purpose of this Invitation to Tender (ITT) is for ECMWF to enter into a long-term contract for the supply of equipment and its associated maintenance and support services, and other services to build a “Network Security Layer” that will be purchased and installed by ECMWF as part of the new networks and security infrastructure at ECMWF's existing facility in Shinfield Road, Reading, UK and its new data centre at Tecnopolo di Bologna, Via Stalingrado, Bologna, Italy from late 2019 onwards.

The ITT will also include:

- professional services for the design validation and onsite engineer presence during the Deployment Phase 1
- training of ECMWF staff

**ECMWF have pre-selected one (1) manufacturer in the context of this ITT: Fortinet, Inc. This ITT is therefore only open to Tenderers who are certified resellers of this manufacturer. The sole exceptions to the utilisation of this manufacturer are optical transceivers and direct attached cables where non-Original Equipment Manufacturers can be used in the proposed solution.**

This ITT is for the initial purchase of Works for the Deployment Phase 1 followed by further purchases of additional Works on a call-off basis over the life of the Contract. The term will be for a minimum period of three (3) years, with ECMWF having the option to extend thereafter to a maximum term of five (5) years.

Further information is included in Volume I (Instructions for Tenderers and Conditions of Tender) of the ITT.

## ITT timetable

ECMWF envisages the below timetable for this ITT. ECMWF reserves the right to amend these dates at any point. If ECMWF decides to amend any of the dates or milestones portrayed above then it shall notify the Suppliers who have expressed an interest or Tenderers via the eProcurement portal.

Date	Description
20 <sup>th</sup> May 2019	Date for release of tender by ECMWF
3 <sup>rd</sup> June 2019	Clarifications close
17 <sup>th</sup> June 2019	14:00 local UK time - Closing date for receipt of tender response
June/July 2019	Evaluation of tenders
1 <sup>st</sup> – 5 <sup>th</sup> July 2019	Presentation and/or demonstration by the shortlisted Tenderers
July 2019	Site visits for ECMWF staff to the premises of the shortlisted Tenderers
July 2019	Preferred bidder(s) notified and negotiations of contractual terms
July / August 2019	Signing of the Contract and issue the purchase order for the Deployment Phase 1
August / September 2019	Start of the User Acceptance Tests
Q4 2019	Start of the Deployment Phase 1 in Bologna

**Table 1: Envisaged timeline for this ITT**

## Evaluation method and selection criteria

Tenderers will be evaluated, utilising the criteria detailed in Table 2 below, based on both written proposals and any oral presentations. However, ECMWF reserves the right to use information other than that provided by the Tenderers in its evaluation.

The following are the key evaluation criteria and their associated weighting that will be used as part of the evaluation process. ECMWF will be looking for strong capability in all the following aspects:

Evaluation criteria	Weighting
<b>Tenderer's Credentials</b> <ul style="list-style-type: none"><li>• A1.1 Pre-Qualification Requirements;</li><li>• A1.2 Presentations, Demonstrations and Site Visits;</li><li>• A1.3 Support Capabilities;</li><li>• A1.4 Professional Services;</li><li>• A1.5 Service Delivery and Acceptance Tests.</li></ul>	20%
<b>Technical and Operational Requirements</b> <ul style="list-style-type: none"><li>• A2.1 Network Security Layer;</li><li>• A2.2 Support and Training.</li></ul>	20%
<b>Pricing and Agreement</b>	60%

**Table 2: Evaluation Criteria & Weighting**

The evaluation of the Tenderer's Credentials will be based on the Tenderer's responses to Volume IA and to Appendix 1 of this document.

The evaluation of the Tenderer's compliance with Technical and Operational Requirements will be based on the Tenderer's response to Appendix 2 of this document.

The evaluation of the Tenderer's response to the Pricing and Agreement criteria will be based on the Tenderer's financial submission in response to Appendix 3 of this document. The evaluation process will be split into three stages.

1. The first stage of the evaluation will be based on the information provided in Volume IA Tender Submission Form and the responses to section "A1.1 Pre-Qualification Requirements" of this volume II document and will determine a list of Tenderers for consideration for the second stage. Tenderers who are not selected to stage two will not be considered further for this ITT. The ECMWF evaluation team shall be permitted to review other parts of the Tender if the team considers this is necessary to determine which Tenders should be fully evaluated in the second stage.
2. The second stage of the evaluation will be based on a full evaluation of the Tenders, including the response to Volume 1A, and will determine a shortlist of Tenderers for invitation to the third stage. Tenderers who are not shortlisted to stage three will not be considered further for this ITT.

3. The third stage will involve either a presentation / Q&A session on ECMWF premises in Reading by the short-listed Tenderer(s) and/or a site visit(s) for ECMWF staff to the premises of the shortlisted Tenderers to meet the team(s) responsible for the ongoing solution support (for example service desk personnel and field engineers). Both options should involve the key bidder staff nominated for this ITT and are expected to take place in accordance with the dates indicated in Table 1 - ECMWF envisages giving at least one week's notice of such. At these events, the Tenderer will have the opportunity to showcase the aspects of their proposed solution or solutions and both parties shall have the opportunity to clarify any outstanding elements of the ITT response. Following the event(s) and any subsequent clarifications, the shortlisted Tenderer(s) will be invited to submit their 'best and final offer' Tender to ECMWF, for final evaluation<sup>1</sup>.

As a result, a Preferred Bidder(s) will be established with whom final contract negotiations will be opened. ECMWF reserves the right to negotiate with one or more Tenderers before taking a decision on awarding the Contract. Within one (1) month following the notification of award of the Contract, any unsuccessful Tenderer may request, in writing, feedback from ECMWF on the evaluation of the Tenderer's Tender submission<sup>2</sup>.

### **ECMWF Questions during Evaluation**

During the evaluation of Tenders, ECMWF reserves the right to ask questions to clarify aspects of Tenderers' submissions. ECMWF will expect Tenderers to answer such questions promptly (normally with one business day of receipt). ECMWF will address questions by email to the contact you nominate in your Volume IA Tender Submission Form or via the procurement portal and you should therefore ensure that your contact monitors his/her emails and the procurement portal at all times during our evaluation.

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<sup>1</sup> ECMWF will review the initial evaluation results for the shortlisted Tenderers and may adjust these results in line with their findings during the presentation / Q&A session and/or the site visit and any revisions made in the 'best and final offer' Tender.

<sup>2</sup> It is at ECMWF's sole discretion if, following any request from a Tenderer, it provides feedback to the Tenderer on their Tender submission.

## Organisation of this document

In accordance with the evaluation method and selection criteria listed in the previous section, the remainder of this ITT is organised as follows:

- Tender Requirement Instructions;
- Appendix 1 Tenderer's Credentials;
- Appendix 2 Technical and Operational Requirements;
- Appendix 3 Pricing and Agreement.

## Tender Requirement Instructions

Tenderers should note that they need to ensure that Requirements are fully addressed, since a partial response may not be considered or evaluated. This includes the Requirements present in this section, in the appendices and in the embedded Excel spreadsheets.

In this document, Requirements are categorised by the bold notations **M**, **D** or **R** to the left of the pertinent section.

Requirement category	Definition
<b>M</b>	denotes a MANDATORY Requirement: a Requirement that must be adhered to, or a performance Requirement that must be met in order that the tendered solution can be accepted by ECMWF. ECMWF will not consider a tendered solution that fails to meet a mandatory specification Requirement (marked M) unless the tenderer offers valid reasons why the feature in question is either unnecessary for, or irrelevant to, the tendered solution or is deemed as an improvement over that specified.
<b>D</b>	denotes a DESIRABLE feature. The extent to which any tender offers features listed as desirable (marked D) will be one of the factors taken into account in selecting the winning tender. If offered, the feature must be included in the overall price for the Works.
<b>R</b>	denotes a REQUEST for information. A response must be given to all such requests. Requests for information (marked R) are intended to provide a description of the construction, philosophy, operation and the cost implications of the tendered solution in areas that are regarded as being of particular importance. A clear response to such requests will be of assistance to ECMWF in the tender evaluation process.

Table 3: Categories of Requirements

With regard to the Tenderer's ability to accommodate the Requirements, the Tenderer must use the following schema for completing the **Detailed Description** and **Self-Score** columns:

1. When populating the **Detailed Description** columns, Tenderers should note that, where relevant, when addressing that a Requirement is met, tenderers must give minimum sufficient detail to explain the way in which the Requirement is met - a simple expression, such as "compliant" or "agreed", will not normally suffice.
  - Unless stated otherwise, the Detailed Description should be no longer than 250 words. Where word counts above 250 words are allowed, the higher limit will be clearly stated. Any text above the maximum specified word count will not be evaluated.
  - Attachments/Annexes should not be submitted unless the Requirement expressly requests or authorises their submission.
  - Tenderers are reminded that referencing web sites or providing hyperlinks does not provide an acceptable means of informing their submission. Any references of these types will be ignored and will not be evaluated.

2. Any additional features not listed in the ITT as Requirements, but which the tenderer feels may be relevant, should be clearly identified and supported by descriptive material.
  - Note that ECMWF seeks focused responses, rather than responses which include a significant amount of standard marketing material. If you wish to include marketing material in your proposal documentation set, it should be provided as discrete documents and limited to only marketing material which is directly relevant to the response and marked as "Marketing Material". ECMWF reserve the right not to evaluate Marketing Material if it deems it to be irrelevant.
3. When populating the **Self-Score** column, the Tenderer must self-score following the definitions in the table below to provide an indication of compliance with the Requirement

<b>Self-Score Value</b>	<b>Definition</b>
3	Tenderer fully meets or exceeds the ECMWF Requirement.
2	Tenderer partially meets the ECMWF Requirement. The Requirement will be met as part of a future commitment.  In the Detailed Description column, describe how the Requirement will be fully met. Specify, where applicable, associated timescale and cost.
1	Tender does not meet the ECMWF Requirement at the time of response. The Requirement will be met as part of a future commitment.  In the Detailed Description column, describe how the Requirement will be fully met. Specify, where applicable, associated timescale and cost.
0	Tenderer cannot meet the ECMWF Requirement.

**Table 4: Self-scoring values and definitions**

Self-Scores will be validated by ECMWF to ensure they have been completed accurately. Where ECMWF's assessment is different from the Tenderer's Self-Score, ECMWF may ask the Tenderer to review and justify its Self-Score.

Tenderers must address the Requirements listed in the table below together with the Requirements listed in the Appendixes.

<b>Tender Requirement</b>			
<b>Requirement number</b>	<b>Requirement</b>	<b>Detailed Description</b>	<b>Self-Score</b>
<b>M(1)</b>	<p>Tenderers must ensure that all Requirements in this ITT are addressed and a response, in electronic format, is posted to ECMWF's eProcurement Portal prior to the deadline; partial responses will not be considered.</p> <p>N.B. efforts have been made to remove duplicate Requirements, where this may occur, please still address the Requirement and/or reference your first response.</p>		
<b>M(2)</b>	Tender documentation must be written in English.		

Except for the Requirements listed in Appendix 1.2 of this Volume II, Tenderers should note that responses to all Requirements specified in Volumes I and II of this ITT must be submitted by the Tender Closing Date. Tenderers invited to make presentations or give presentations to ECMWF in Stage 3 of the evaluation process may be required to address the Requirements set out in Appendix 1.2



## Appendix 1 Tenderer's Credentials

### A1.1. Pre-Qualification Requirements

Pre-Qualification Requirements			
Requirement number	Requirement	Detailed Description	Self-Score
M(3)	Tenderers must confirm that, with the notable exception of optical transceivers and direct attached cables, the proposed solution use products made by the following manufacturer: <ul style="list-style-type: none"> <li>Fortinet, Inc.</li> </ul>		
M(4)	Tenderers must confirm they are a certified reseller/partner/integrator of the manufacturer: Fortinet, Inc. Tenderers must indicate and provide evidence of the level of accreditation/partnership.		
M(5)	Using section 6 of Volume IA (Tender Submission Form), the Tenderer must provide an executive summary to describe the key aspects and advantages of its Tender. The executive summary must: <ul style="list-style-type: none"> <li>Provide a top level description of the Tenderer's design</li> <li>Describe how the Tenderer will satisfy the technical and other Requirements set out in the ITT;</li> <li>Define the advantages to ECMWF of accepting the Tender</li> <li>Demonstrate the ability of the Tenderer to supply and support its solution</li> <li>Describe the commercial and pricing benefits offered the Tenderer's solution</li> <li>Detail the Tenderer's relationship with the proposed suppliers of hardware</li> <li>Where third parties are referenced in the Tender, describe the Tenderer's relationship with them and the way in which they will contract with them</li> </ul> The executive summary is intended to give ECMWF an overview of the Tender so that it can understand the Tenderer's approach. Tenderers are not expected to repeat detailed technical, pricing or other responses in their executive summaries.		

	(The response to this Requirement must be no longer than 1000 words but may also contain diagrams).		
<b>M(6)</b>	Tenderers must list the core technical competencies of their organisation. This must include the details of what is considered to be the key technology areas supported by the organisation. (Maximum 500 words).		
<b>R(7)</b>	Tenderers are invited to indicate the technical certifications/accreditations/awards relevant to this tender that their organisation holds.		
<b>R(8)</b>	Tenderers are invited to indicate their proposed account management structure as follows: <ul style="list-style-type: none"> <li>• describe your governance processes to manage an effective relationship and the successful delivery including roles and responsibilities of people involved from both sides, the frequency of the different meetings and the purpose of each meeting;</li> <li>• describe the key management dashboards and empirical information that you suggest are used to govern the relationship;</li> <li>• propose how continuous improvements will be made to the governance process.</li> </ul>		
<b>R(9)</b>	Tenderers are invited to provide a description of their territorial presence in Italy, with a focus on the Bologna area.		
<b>M(10)</b>	Tenderers must confirm that they have the capabilities to provide 24x7x365 support and break/fix maintenance of all hardware components in Bologna		
<b>R(11)</b>	Tenderers are invited to describe their capabilities to provide 24x7x365 support and break/fix maintenance of all hardware components in Bologna.		
<b>M(12)</b>	Tenderers must confirm that they have the capabilities to provide 24x7x365 support in English.		
<b>R(13)</b>	Tenderers are invited to specify whether the support and maintenance of the manufacturer's hardware and software equipment can be done directly by the Manufacturer.		
<b>D(14)</b>	Tenderers shall state their ability to offer professional services for onsite engineer presence during the Deployment Phase 1.		
<b>R(15)</b>	Tenderers are invited to describe their organisation's approach to working in a relevant multi-vendor environment, with evidence supporting their success of working in such an environment.		
<b>R(16)</b>	Tenderers are invited to describe their organisation's approach to problem-solving in a relevant environment, with evidence supporting their success at solving.		
<b>R(17)</b>	Tenderers are invited to Describe their organisation's standard Project Management process.		
<b>R(18)</b>	Tenderers are invited to provide detail/evidence of any Project Management certifications.		

<b>R(19)</b>	Tenderers are invited to describe their organisation's standard Quality Management process.		
<b>R(20)</b>	Tenderers are invited to provide detail/evidence of any Quality Management certifications.		
<b>R(21)</b>	Tenderers are invited to describe their organisation's standard Information Security management process.		
<b>R(22)</b>	Tenderers are invited to provide detail/evidence of any Information Security certifications.		
<b>R(23)</b>	Tenderers are invited to specify the number of projects which they have undertaken in the last three (3) years using a solution of the kind proposed in response to this ITT and the same manufacturer. .		
<b>R(24)</b>	Tenderers are invited to identify 3 comparable projects (together with references) by answering Question 4 in Volume IA of this ITT. Please note that no additional response is required against this Requirement R(24).		
<b>M(25)</b>	Tenderers must confirm that they are able to quote prices in Euros (€) and that, if selected by ECMWF, Tenderers will be prepared to contract in Euros (€).		

## A1.2. Presentations, Demonstrations and Site Visits

Requirements for Presentations, Demonstrations and Site Visits			
Requirement number	Requirement	Detailed Description	Self-Score
<b>M(26)</b>	If requested by ECMWF, tenderers must give a presentation of their tender at ECMWF in Reading. The date of the presentation will be made known following receipt of the tenders in accordance with the dates indicated in Table 1.		N/A
<b>M(27)</b>	If requested by ECMWF, tenderers must provide demonstrations of the proposed solution or solutions. Arrangements for the time, location and exact content of the demonstrations will be made following receipt of tenders in accordance with the dates indicated in Table 1.		N/A
<b>M(28)</b>	If requested by ECMWF, tenderers must organise a site visit for ECMWF staff to their premises to meet the team(s) responsible for the ongoing solution support. Arrangements for the time, location and exact agenda of the site visit will be made following receipt of tenders in accordance with the dates indicated in Table 1.		N/A

### A1.3. Support Capabilities

The maintenance and support for the Network Security equipment can be delivered directly by the Contractor or by the manufacturer.

The service needs to include as a minimum:

- Advanced Replacement of faulty hardware, with Next Business Day shipment after an RMA has been issued;
- Software/Firmware update entitlement;
- Access to manufacturer's Technical Support Service via e-mail or via a support portal for RMAs and Troubleshooting 24x7.

Requirements for Support Capabilities			
Requirement number	Requirement	Detailed Description	Self-Score
M(29)	Tenderers must commit to the provision of support services for 24 hours per day, 365/366 days per year including bank holidays for software and hardware support with a First Response Time of no more than one (1) hours for priority P1, P2 tickets.		
R(30)	Tenderers are invited to provide a description of their standard support process, including: <ul style="list-style-type: none"> <li>• process used to record, manage and report Incidents;</li> <li>• methods used by the clients to raise incidents with the Service Desk;</li> <li>• first Response Times;</li> <li>• target resolution times;</li> <li>• time for permanent fix of an incident.</li> <li>• duration of the support</li> <li>• access to firmware/software entitlements</li> <li>• hours of support (24/7 or business hours, etc)</li> </ul>		
R(31)	Tenderers are invited to provide incident resolution statistics for the year 2018 about how many incidents have been resolved within applicable SLAs (e.g.: P1, P2, P3).		
R(32)	Tenderers are invited to describe the nature, capacity, and capability of their support lines: first, second and third.		
M(33)	Tenderers must confirm that a fault reference number or equivalent will be issued within no more than 5 minutes of a ticket being raised.		
R(34)	Tenderers are invited to describe how the Help Desk service is to be implemented. In particular, if the Tenderer is a reseller it shall describe which parts of the service are carried out by the reseller and which parts, if any, are carried out by the		

	Manufacturer. If some parts of the service are carried out by the Manufacturer, the Tenderer shall describe at which point of the process this occurs.		
R(35)	Tenderers are invited to describe how an on-site professional services request will be handled, for example, how the effort is estimated and what is the lead time required when a purchase order for the service is placed.		
R(36)	Tenderers are invited to describe the processes in place to deal with delivery of equipment that may be: <ul style="list-style-type: none"> <li>• “Dead on Arrival”;</li> <li>• incorrect;</li> <li>• shipped to the wrong address.</li> </ul>		
R(37)	Tenderers are invited to describe what contingency plans are in place to continue the supply of spare parts after the failure of the normal sources of such parts.		
R(38)	Tenderers are invited to describe any remote monitoring and diagnostic capabilities, such as analytics that may be used to proactively identify failures.		

#### A1.4. Professional Services

Following the award of Contract, ECMWF together with the Contractor will validate the Low-Level Design and prepare the configuration files for the Deployment Phase 1. ECMWF will be responsible for the deployment and maintaining the configuration files and the general topology after this.

ECMWF may require onsite engineer presence during the Deployment Phase 1 to assist with the configuration and deployment work. The Tenderers are invited to propose their services to fulfil this need.

Requirements for Professional Services			
Requirement number	Requirement	Detailed Description	Self-Scoring
D(39)	Tenderers shall state which professional services they can offer to validate the Low-Level Design required to: <ul style="list-style-type: none"><li>fulfil the Network Security Layer High-Level Design description in paragraph A2.1.1 and A2.1.2;</li></ul>		
D(40)	Tenderers shall state which professional services they can offer to support ECMWF during the Deployment Phase 1, including onsite engineer presence at ECMWF site in Bologna.		
R(41)	Tenderers are invited to state if they can offer additional professional services such as: <ul style="list-style-type: none"><li>perform a firmware upgrade of equipment in scope of this ITT at ECMWF site in Bologna;</li><li>perform a firewall policy validation;</li><li>perform a security assessment;</li></ul>		

### A1.5. Service Delivery and Acceptance Tests

As described in Schedule 4 of Volume III, the acceptance testing of the agreed solution for the Network Security Layer infrastructure will be performed at ECMWF premises in Reading as follows:

1. ECMWF together with the Contractor will agree on the exact topology and the size of the Pilot Infrastructure that will be used for the testing, but it must be based on the agreed solution and its associated Low-Level Design and must include at least the two clusters of DC Firewall, one cluster of Offices Firewall and one FortiManager VM instance;
2. ECMWF together with the Contractor will deploy the Pilot Infrastructure in ECMWF's data centre located in Reading;
3. Following completion of the deployment of the pilot infrastructure, the Contractor will perform its standard installation test;
4. Following completion of the Contractor's standard installation test, a Functional Test period of at least 7 calendar days will start whereby ECMWF will run various diagnostic, check-out, demonstration and test routines. The purpose of the test is to establish that the equipment is functional and that various aspects of its performance and behaviour are in accordance with the published specifications, the tender documents and the Contract;
5. Following the completion of the Functional Test, a User Acceptance Test period of at least 28 calendar days during which a batch of tests will be run to ensure that the functionalities required to fulfil the LLD of the agreed solution are fully functional;
6. Following the completion of the User Acceptance Test, the Pilot Infrastructure will be dismantled and moved to ECMWF's data centre in Bologna by the Contractor.

Requirements for Service Delivery and Acceptance Tests			
Requirement number	Requirement	Detailed Description	Self-Score
D(42)	Tenderers shall outline their proposed method of Project Management applicable to this ITT, their specific experience in applying that method of Project Management in a relevant environment and the composition of their Project Team.		
M(43)	Tenderers must confirm their acceptance of Schedule 4 of Volume III that contains the standards of tests, which must be met by the equipment before ECMWF will accept it.		
M(44)	Tenderers must commit to providing a delivery lead time for equipment when providing the quote pertaining to that equipment.		

R(45)	Tenderers are invited to specify the lead time for delivery of equipment after placement of the purchase order.		
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## Appendix 2 Technical and Operational Requirements

### A2.1. Network Security Layer

#### A2.1.1. Data Centre High-Level Design

The following diagram presents the main elements of the Network Security Layer for the data centre in Bologna:

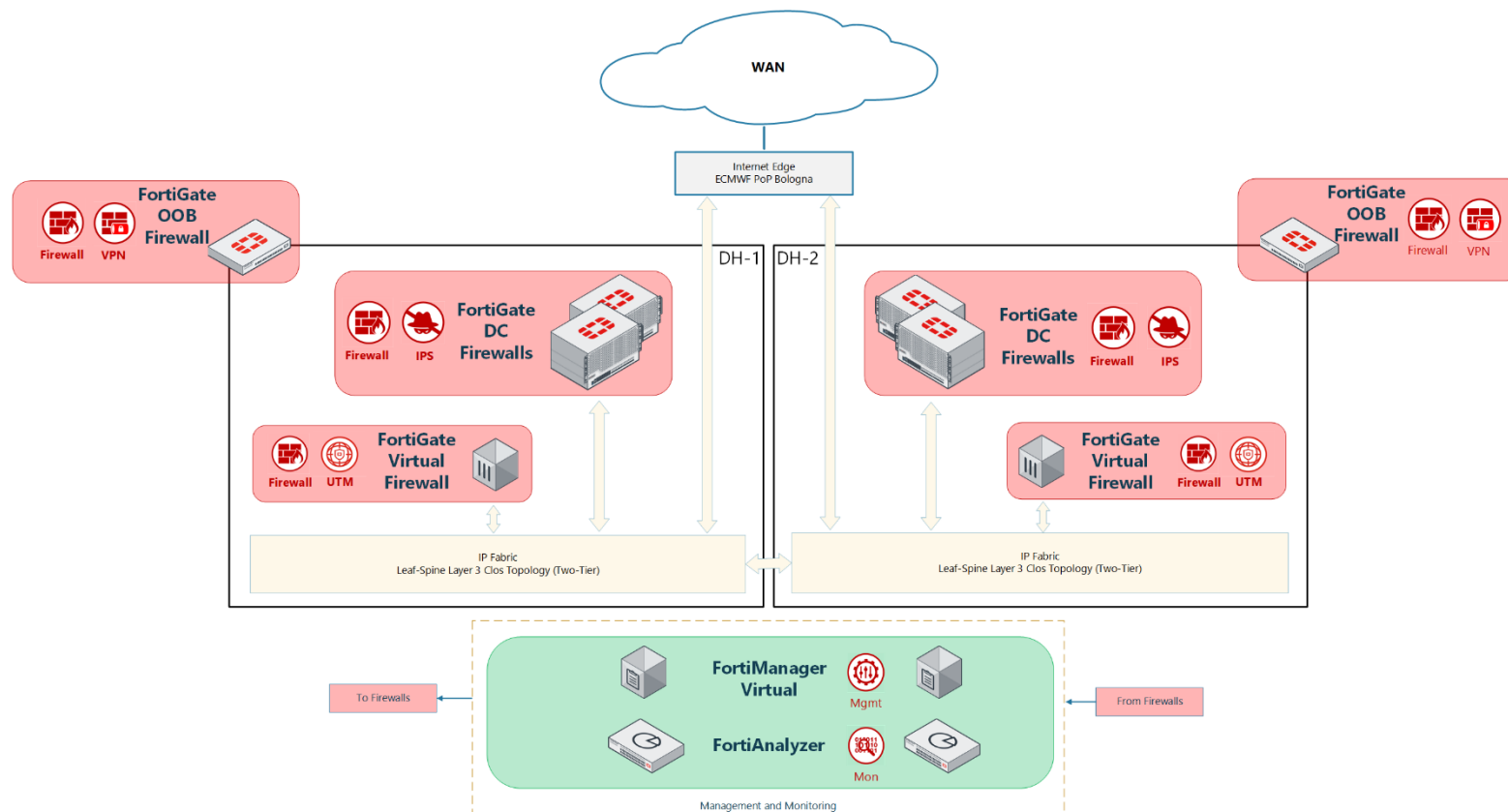


Figure 2: Datacentre Network Security Layer

The following are the key elements to consider as part of the data centre Network Security Layer design:

#### **A2.1.1.1. Data Centre Firewalls**

To provide increased redundancy and resilience, a cluster of two (2) datacentre FortiGate firewalls will be deployed in each Data Hall. The two clusters will be configured to implement network segmentation and policing of traffic between connected systems. Security zones segmentation will be fulfilled on the firewall clusters using Interfaces/zones and Virtual Domains (VDOMs) and on the IP Fabric using routing instances (or VRFs). Each Data Hall will have identical security zones and VDOMs for symmetry and ease of management, monitoring and troubleshooting. The firewalls will only have connections to the “local” Data Hall network infrastructure. The decision whether physical or virtual interfaces are used will be based on traffic flows and bandwidth requirements for each security zone and the level of network segmentation required. This element will be defined in the Low-Level Design document.

In addition to the firewall protection, the IPS service will be enabled on the DC firewalls cluster.

#### **A2.1.1.2. Virtual Firewall Instances**

A virtual instance of FortiGate firewall will be deployed in each Data Hall for specific segmentation of the virtual infrastructure.

In addition to the firewall protection, the UTM services will be enabled on the virtual firewall. The UTM functionalities will be selectively activated only on specific firewall rules to optimise performance and avoid degradation of critical business services.

#### **A2.1.1.3. Out of Band Firewalls**

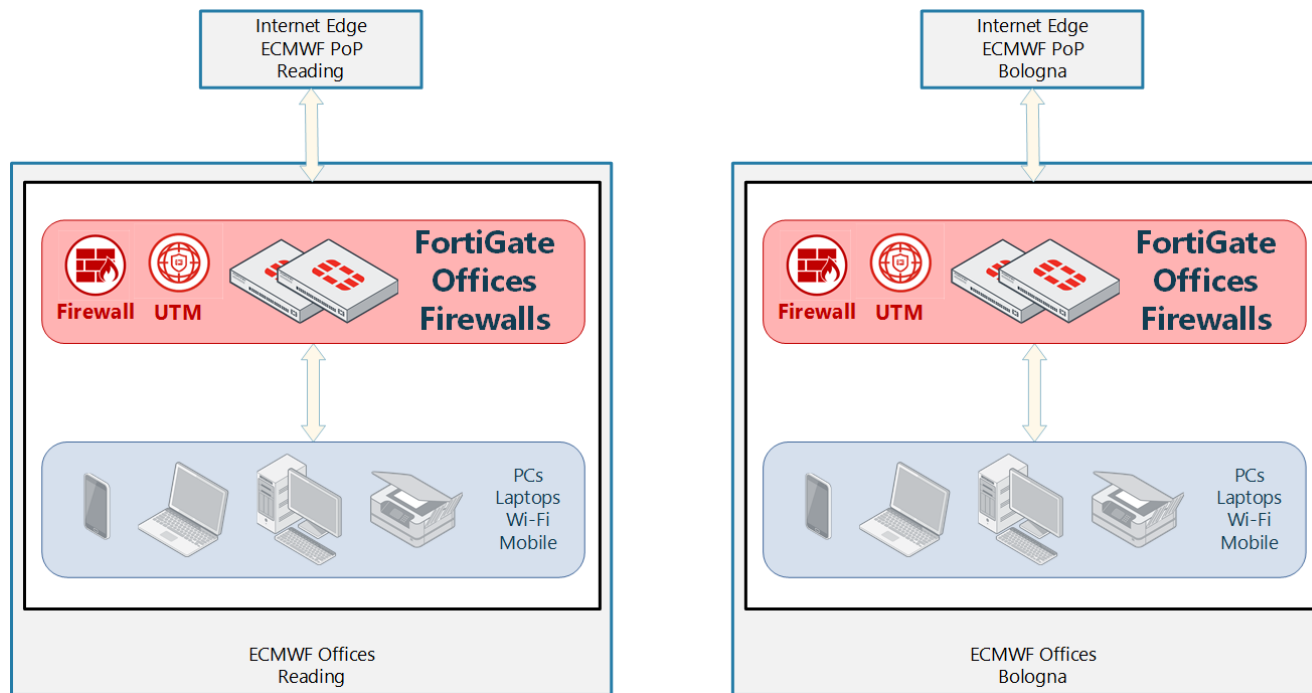
To protect the Out of Band access to the Bologna data centre, a FortiGate firewall will be deployed in each Data Hall.

#### **A2.1.1.4. Management and Monitoring**

A virtual instance of FortiManager and a physical FortiAnalyzer will be deployed in each Data Hall connected to the management and monitoring network. By design, the two DC Firewall clusters, the Virtual Firewall Instance and the OoB Firewall need to maintain the same policies to allow redundant routes and security controls. At the same time, it is necessary to centralise the management and the monitoring of the other network security equipment and functionalities implemented.

### **A2.1.2. Offices High-Level Design**

The following diagram presents the main elements of the Network Security Layer for the offices in Bologna and Reading:



**Figure 3: Offices Network Security Layer**

The following are the key elements to consider as part of the offices Network Security Layer design:

#### **A2.1.2.1. Offices Firewalls**

A cluster of two (2) FortiGate firewalls will be deployed in Reading Offices and Bologna Offices.

In addition to the firewall protection, the UTM services will be enabled on the offices firewall clusters.

#### **A2.1.3. Proposed solution description**

Requirements for the Proposed solution description			
Requirement number	Requirement	Detailed Description	Self-Score
M(46)	Tenderer must provide a summary of the technical solution or solutions that they propose to: <ul style="list-style-type: none"><li>• fulfil the High Level Design description in paragraphs A2.1.1 and A2.1.2;</li><li>• meet the Requirements listed in spreadsheet "Volume II TechSpec".</li></ul> More than one solution can be proposed. (The response to this Requirement must be no longer than 1000 words for each proposed solution but may also contain diagrams).		
M(47)	Tenderers must complete the "Volume II TechSpec" spreadsheet annexed with this tender document. If more than one solution is proposed, then a separate "Volume II TechSpec" spreadsheet must be completed for each additional solution.		
M(48)	Tenderers must guarantee that hardware and software features required to provide the purposed solution or solutions are available for at least five (5) years from the date of Contract signature.		
R(49)	Tenderers are invited to describe any additional features not listed in the ITT as Requirements, which the Tenderer feels may be relevant and beneficial to the proposed solution or solutions.		

## A2.2. Support and Training

### A2.2.1. Support of the Tendered Hardware and Software

Requirements for Support of the Tendered Hardware and Software			
Requirement number	Requirement	Detailed Description	Self-Scoring
M(50)	Tenderers must explicitly undertake to provide spare parts and support for the hardware and software acquired under this ITT in accordance with Schedule 3 of Volume III for at least five (5) years from the date of Contract signature. Where this involves an arrangement with the Manufacturer, responsibility for the provision of such support must in any case rest with the Tenderer.		
R(51)	Tenderers are invited to describe their policy regarding maintenance, spare parts and support for the hardware, firmware and software of the Deployment Phase 1 on reaching their respective end of life. In particular, any replacement policy or policies for components that will no longer be supported should be stated.		

### A2.2.2. Training

Requirements for Training			
Requirement number	Requirement	Detailed Description	Self-Scoring
M(52)	Tenderers must provide training and knowledge transfer programme, given at ECMWF's Reading premises or elsewhere, which must provide up to 10 ECMWF operational staff with sufficient understanding of the working of the software and hardware being tendered to enable them to provide effective day-to-day and emergency operational support including documentation, administrative tools, performance analysis, software upgrades and changes to configuration files.		
R(53)	Tenderers are invited to state which manufacturer's and/or tenderer's training programmes are available for ECMWF operational staff during the course of the Contract and state which of those have been included and costed on the BoM.		

### A2.3. Transceivers and Cables

ECMWF would like to have the possibility to use non-OEM third-party transceivers. This section assesses the possibility and feasibility of doing so.

Requirements for Transceivers and Cables			
Requirement number	Requirement	Detailed Description	Self-Scoring
M(54)	Tenderers must state what is their policy in regard to support of third party optic transceivers and direct attached cables.		
M(55)	Tenderers must specify whether the use of third-party optic transceivers and direct attached cables is possible in the proposed solution or solutions. Tenderers must also state the manufacturer's policy in respect of such use.		
R(56)	Tenderers are invited to provide details of how support incidents will be handled if 3rd party optic transceivers and direct attached cables are being used on the Manufacturer's hardware.		
M(57)	Tenderers must confirm that the optic transceivers and direct attached cables used in the proposed solution or solutions are compatible with the proposed equipment.		
M(58)	Tenderers must confirm that the optic transceivers and direct attached cables used in the proposed solution or solutions are compliant with the applicable relevant standards.		
M(59)	Tenderers must confirm that each transceiver and direct attached cables is individually tested at the factory and again tested by the supplier after coding.		
M(60)	Tenderers must confirm that in the event when optical transceivers and direct attached cables are excluded from support but purchased as part of the Contract, the optical transceivers and direct attached cables will fall under the standard warranty terms subject to the warranty period starting on the time of purchase.		
D(61)	Tenderers shall confirm that limited lifetime warranty for the proposed transceivers and direct attached cables is five (5) years or more from the time of purchase.		
D(62)	Tenderers shall confirm that advanced product replacement for transceivers and direct attached cables is two (2) years or more from the time of purchase.		
R(63)	Tenderers are invited to provide information on failure rates of each transceiver and direct attached cables type of the proposed solution(s).		

## Appendix 3 Pricing and Agreement

ECMWF expects to see full pricing transparency in your Tender response and to be able to understand the figures first time without the need to clarify with the Tenderer in question.

Where applicable, please ensure that all and any conditions and/or restrictions are made explicit e.g. unanticipated expenditures (rush charges, etc.) and including the net pass-through of third-party costs/commissions/discounts.

When providing full and transparent breakdown of any summary figures, the Tenderer must be specific on how these are derived i.e. unit costs, day rates, quantities, discounts, exchange rate, how personnel effort is split between phases of work, etc.

### Pricing Requirements

Tenderers are required to quote prices on the following basis:

- a) Prices quoted by Tenderers in the Bill of Materials shall be firm and fixed;
- b) For the Deployment Phase 1 and its associated Bill of Material, prices are fixed and firm for three (3) months after the closing date from receipt of tenders and ECMWF can use these prices to place orders at Contract signature;
- c) For purchases beyond the Deployment Phase 1, guaranteed level of discounts from Manufacturers' prices for hardware and support will apply;
- d) The prices and discounts quoted against (c) can be used for any additional purchase orders placed by ECMWF beyond the Deployment Phase 1;
- e) Prices must be quoted in Euros (€) and ECMWF will use Euros (€) in the Contract.

Requirements for Pricing and Agreement			
Requirement number	Requirement	Detailed Description	Self-Scoring
M(64)	Tenderers must provide their pricing for the bill of materials for Deployment Phase 1 using the "Volume II BoM" spreadsheet annexed with this tender document. Tenderers are invited to add as many lines as necessary to the spreadsheet to provide the pricing of all the elements required.		
M(65)	Tenderers must confirm that all related costs to cover all the Works under Deployment Phase 1 includes the following: <ul style="list-style-type: none"><li>• all Hardware and Software;</li><li>• all software licences relating to the Works (if applicable);</li><li>• all Maintenance and Support Services are required for 24 hours/day, 7 days/week for the equipment and software (if applicable) – you must also detail all the support level options and associated SLAs;</li></ul>		

	<ul style="list-style-type: none"> <li>• delivery;</li> <li>• acceptance testing;</li> <li>• support during the stabilisation period after Deployment Phase 1, i.e.: “hypercare” (expected to be 6 months duration);</li> <li>• documentation and training.</li> </ul>		
<b>M(66)</b>	<p>For the Deployment Phase 1, Tenderers must confirm that prices:</p> <ul style="list-style-type: none"> <li>• include the costs of the mandatory features as described in this ITT;</li> <li>• be quoted in Euros (€);</li> <li>• be inclusive of shipping, delivery;</li> <li>• be exclusive of all appropriate import duties and UK or Italian taxes;</li> <li>• be valid for three (3) months after the closing date for receipt of tenders;</li> </ul>		
<b>D(67)</b>	Tenderers that use a reference Manufacturer's list price that is in a currency other than Euros (€) must provide the currency exchange rate or rates applied to obtain the pricing in Euros (€).		
<b>M(68)</b>	<p>ECMWF would like to establish a framework with the tenderer for future purchases that are not part of Deployment Phase 1 and for the duration of the contract.</p> <p>Tenderers must give guaranteed levels of discount on the Manufacturer's standard list prices for all components of the Works and describe how list prices can be periodically made available to ECMWF during the course of the Contract.</p>		
<b>M(69)</b>	For later purchases that will take place after the completion of the Deployment Phase 1, the Contractor's quotes must be exclusive of all appropriate import duties and UK or Italian taxes.		
<b>M(70)</b>	Tenderers must state the maximum price of support services for future equipment (equipment that does not form part of Deployment Phase 1) and software licences acquired under this Contract as a percentage of the applicable discounted purchase price of the equipment or software licence.		
<b>M(71)</b>	Tenderers must provide quotes for different levels of the support services for the equipment listed in the “Volume II BoM” spreadsheet provided for a period of three (3) years.		
<b>D(72)</b>	In the case when third-party optic transceivers and direct attached cables are used in the proposed solution or solutions, Tenderers shall provide quote in the “Volume II BoM” spreadsheet. Tenderers shall state the level of discount and mark-up off third-party list price.		